Bihar Urban Infrastructure Development Corporation

(Govt of Bihar Enterprise)

Request for Proposal

for

EMPANELMENT OF VENDORS FOR SUPPLY OF SOLID WASTE MANAGEMENT EQUIPMENT (GOODS) FOR ULBs IN BIHAR UNDER RATE CONTRACT

VOLUME-2 of 3

SCHEDULE OF SUPPLY

(Ref. Notification Number: BUIDCo/Yo-409/14-64)

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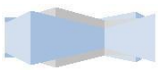


Section III Schedule of Supply

1 List of Goods and Related Services

SL No	Equipment/Vehicle
1	Domestic Polyethylene Bins of 12 Litres Capacity
2	HDPE/LLDPE Litter Bin with MS Frame (60 Litres)
3	Hand Card/Wheel Barrow for Road Sweeping and Nali Desalting
4	Mini Garbage Collector and Auto Tipper
5	Secondary Storage Containers of 3.0 Cubic metre
6	Twin Bin Dumper Placer for 2.5 cum capacity containers
7	Twin Bin Dumper Placer for 3.0 cum capacity containers
8	Truck with hydraulic lift for Transportation of Solid Waste 10 cum. capacity
9	Truck with hydraulic lift for Transportation of Solid Waste 5 cum. capacity
10	Tractor, Trolley and Water Tanker
11	Loader Backhoe
12	Skid Steer Loader
13	Weigh Bridge for weighing of Solid Waste at Land-fill Sites
14	Vehicle mounted combined sewer cleaning suction cum jetting machine of 8500 Liters
15	Vehicle mounted sewer cleaning jetting machine of 3000 liters
16	LCV mounted Sewer Cleaning Suction Machine of 4000 Litres
17	Auto-Rickshaw mounted sewer cleaning jetting machine of 500 liters capacity
18	Fogging Machine
19	Mobile Toilet

2 Delivery and Completion Schedule

Delivery of Goods and Related Services shall be carried out as per provisions of Purchase Order which may be issued by the Purchaser time to time for such quantity as may be required by the concerned Urban Local Bodies in Bihar or any other department in Bihar.

3 Technical Specification

1. Domestic Polyethylene Bins of 12 Litres Capacity:

The Bin shall be one piece moulded, heavy duty of approximately 12 litres capacity made out of FDA approved virgin grade polyethylene material manufactured from blow moulding process, absolutely smooth, chemical resistant, blended with stabilizers, anti-corrosive, anti-acidic, non-toxic and free from joints, welds or rims provided with moulded projections and with moulded lids to prevent spreading of smell, flies, mosquitoes etc. The colour of the bins shall be as per prevalent colour codes or as approved by purchaser. In general, the Green bins shall be meant for storage of segregated bio-degradable waste and White or Blue bins for Non-biodegradable/Recyclable waste. The bins shall comply with the critical requirements of MSW Rules, 2000.

Specifications of Bin

- Specially moulded projection for extra strength.
- High impact strength; Twist type lockable lid; Round in shape without sharp corners or welds; Built-in bottom grip (2 Nos) for easy lifting of bin and unloading of waste.
- Top Diameter: 200 to 250mm
- Bottom Diameter: 180 to 220mm
- Height: 250 to 320mm
- Thickness: 1.5 mm
- Volumetric Capacity: 12 L
- Lid : Fully openable
- Colour : Green and White or Blue or as specified.
- Durability: Reusable, washable, smooth and sanitary to satisfy the critical needs of MSW Rules, 2000.
- Marking: Bin shall be embossed with manufacturer's logo and shall have capacity and ULBs name prominently painted/stickered / screen printing over it.

Schematic view of 12 Litre PE Domestic Storage Bins

2. HDPE/ LLDPE Litter Bin with MS Frame (60 Litres)

(a) General Requirements: The litter bins shall be smooth, strong & sturdy and should conform to the following:

- The internal form and surface of the container shall be such that it does not trap the contents.
- There shall be no sharp edges on the container.
- The internal & external surfaces shall be smooth and non porous, free from cracks, splits, dents, distortion, blisters, voids, air bubbles and other surface blemishes or defects.
- The bins are expected to be used in outdoor conditions. They should be able to withstand outdoor weather conditions in India.
- The test certificate of U.V. stabilization from original manufacturer of polyethylene is to be supplied with bins. The approved make of the polyethylene material shall be IPCL/GAIL/Reliance.
- The moulded plastic container shall be made in one piece through Injection/ Roto Moulded Process with top rim outside.
- The bins shall conform to the colour code and have embossment of Logo of ULBs and any other markings as specified through a sticker fixed on the body of container.
- The bins shall be provided with adequate stiffeners/ribs on all sides and at bottom for enhancing its structural strength.
- The Front rim of the bin shall be fitted with support and guide ribs and bar net of high capacity, double angle edge for greater safety during tipping.

(b) **Dimensions and Other particulars:**

1	Volume	60 Ltrs.
2	Container Dimensions:	
a)	Top	Min 350 x 350mm (clear inside dimensions)
b)	Bottom	Min 300 x 300mm (clear inside dimensions)
c)	Height	Min 550 mm (clear dimensions)

3	Thickness	Minimum 4mm
4	Embossing	Logo of the ULB to be embossed on one side of the container body
5.	Colour	Blue or green (as specified)
6	MS Jacket	A jacket of MS Flat 30mm x 5 mm shall be riveted to the bin.
7	MS Frame	A Frame of 32x32x5 mm MS Square Pipe comprising Two No verticals & one Nos Horizontals shall be provided with 2 Nos of 32x32x5 mm MS Angle Hold fasts 200mm long at Bottom. Locking arrangement shall be provided.
8	Lid	The lid shall be fully openable but should not depart from the bin at the time of opening. In closed position there should be garbage dropping space on the front side.
9	Handle	On the back side of the bin there should be an inbuilt HDPE Rod for easy pushing of the Bin.
10	Painting	All metallic parts shall be powder coated with minimum 40 micron thickness & black in colour.

(c) **Material specifications and Body Construction :** The body of the bins shall be made of Virgin UV stabilized High Density Polyethylene (HDPE) / Linear Low Density Polyethylene (LLDPE) with appropriate quantity of HALS to give long service with continuous outdoor exposure with or without blending of any carbon black manufactured by Roto moulding/ Injection Moulding process and confirming to the typical characteristics as per BIS/ ASTM standards. It should meet the requirements stipulated in standard IS 10146-1982 and confirming to the following :

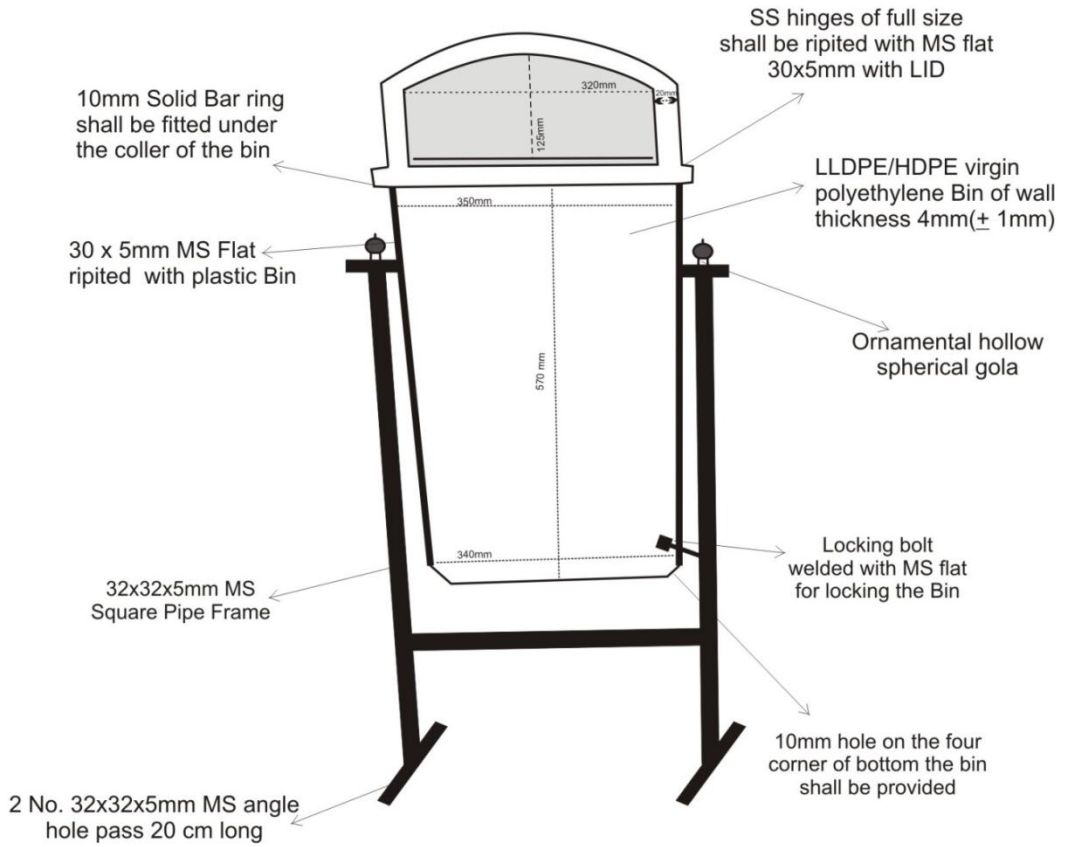
S. No.	**Property**	**Testing Method**	**Unit**	**Value**
1	Density	IS-7328-1992	gm/cm^2	Should be between 0.94 to 0.96
2	Melt Flow Index	IS-2540-1963	gm/10min	0.8 to 5
3	Tensile Strength	IS-8543, part-4/Sec 7- 1984	Kg/ cm^2	224 to 255
4	Flexural Modulus	IS-13360 Part 5/Sec 7- 1996	MPa	900 to 1000

S. No.	Property	Testing Method	Unit	Value
5	Hardness (Shore)	IS-13360 Part 5/Sec 1-1992	D Scale	>D 50
6	Vicat Softening Temp.	IS-13360, Part 6/Sec 1-1992	Deg. C	> 90
7	Impact Strength (2.5kg/1 mts)	IS-12701-1996	J/mm2	No sign of cracking, puncture/damage of sample
8	Weathering	IS-22530-1963	-	No 4 gray scale.
9	Colour fastness to Artificial light/Rating	IS-2454: 1985	As per guidelines of IS 2454 (using sun test) CPs + Instrument	
10	Accelerated Ultra Violet Test (QU.V)	ASTM-G-53, (50˚ C)	Should be tested with QUV test type accelerated weather meter for 200 hours. Tensile strength and flexural modules should each be not less than 70% of the values before exposure.	

(d) **Tests for Litter Bins:**

- The bin container should be free from defects like de-shaping, holes, cuts/cracks etc.
- The thickness is to be checked by ultrasonic gauge
- The density test/MFI/tensile strength/flexural modulus / impact / hardness / weathering (colour fastness) and accelerated ultra violet tests (QUV) on bin material and bins are to be carried out only at Government approved laboratory and the testing charges shall be borne by the supplier.
- One sample per supply lot shall be collected at random by inspecting authority in the presence of supplier and got tested by the supplier at his expense.
- Any other test on container/lid/MS frame/Wheels/Finish/or any other component as decided by the inspecting authority shall be got conducted by the supplier.

Road Side Litter Bin
60 Ltr. Capacity with MS Frame


SS hinges of full size shall be ripited with MS flat 30x5mm with LID
10mm Solid Bar ring shall be fitted under the coller of the bin
LLDPE/HDPE virgin polyethylene Bin of wall thickness 4mm(± 1mm)
30 x 5mm MS Flat ripited with plastic Bin
Ornamental hollow spherical gola
Locking bolt welded with MS flat for locking the Bin
32x32x5mm MS Square Pipe Frame
10mm hole on the four corner of bottom the bin shall be provided
2 No. 32x32x5mm MS angle hole pass 20 cm long
320mm
125mm
350mm
570 mm
340mm

3. Hand Carts/ Wheel Barrow for Road Sweeping and Nali Desilting

Material: The material of construction shall be as given below:

Steel Sheet: Steel Sheets shall be not less than 1.60 mm in thickness and shall conform to IS: 1079-1973

Steel Selection Bars and Rivets: Steel sections and bars shall conform to IS: 1977-1975 and IS: 226-1975. Rivet bars shall conform to IS: 1148-1973

Steel Tubes: Steel tubes shall be medium class conforming to IS: 1239(Part I)-1973

Capacity: The wheel barrows shall be of 85 litres/110 litres/140 litres capacities:

The wheelbarrows shall withstand a proof load of 300 Kg for 85 litre/ 370 Kg for 110 litre and 470 Kg for 140 litre sizes without any permanent deformation of the members. The proof load shall be applied by filling the body of wheelbarrow with a suitable material.

Body

Construction- The body shall be either cut from a single sheet of steel, the joints being secured by revetting or welding or it may be solid-drawn pressing from a single sheet. If joints are secured by revetting, the rivets shall be of diameter not less than 6mm and shall be placed at a spacing of not more than 10 cm.

The body shall have top edge reinforced by one of the following methods:

a. The edge rolled over a steel rod of not less than 8mm diameter in order to form a bead and to retain the rod.

b. A mild steel band not less than 20x5 mm in cross-section closely riveted or welded to the outside of top edges. If riveted, the rivets shall be of diameter not less than 6mm and shall be placed at each end of the strip and at intermediate points not more than 15 cm apart.

c. Additional reinforcement shall be provided at both fronts corners by welding both edges of the band to the body sheeting, or by additional rivets.

d. The body shall be fixed to the chassis by welding or with black mild steel bolts with cup heads, round necks and square or hexagonal nuts, the bolts being of not less than 8mm diameter.

e. The body shall be so designed that the position of centre of gravity aids the forward motion of the wheelbarrow when in use (filled to its maximum nominal capacity) with normal inclination to the horizontal without causing spillage of the material.

f. The design and dimensions shall be such that when the body is fixed to the chassis, the liquid capacity is not less than 35 litres for 85 litre/ 55 litre for 110 litre/ 70 litre for 140 litre capacity wheelbarrow. This capacity shall be determined by placing the barrow on a level surface and filling it with water. The handles of the barrow shall then be raised until the undersides of the ends of the handles are 75 cm above the level of surface on which the wheel is resting; the water remaining after raising the body to this position, shall then be measured.

Chassis

The chassis frame shall consist either of a single length of tube of 2.5mm nominal bore or any other suitable steel section such as flat of size 30x6 mm or angle or channel section of equivalent strength, suitably bent to form a support for the wheel and the body.

The legs of the chassis shall be formed as part of the tube or other steel section used for the construction of frame or shall consist of separate length of tube or steel section similar to that used for the frame, bent to form a bow and welded to the main frame.

The frame shall be reinforced with two mild steel bars, each not less than 30x5 mm in cross-section and arranged to span between the chassis frame at the handle end as well as the wheel end of the body, with their ends closely formed round or welded to the frame. Each leg shall be braced by a mild steel bar not less than 30x6 mm in cross-section closely formed round the bottom of the leg and arranged to provide an intermediate support for the body. Alternately a X type bracing of 25x6 mm steel strip and spanning between the two legs may be provided.

Two front steel braces, not less than 25x6 mm in cross-section shall be fixed between the wheel ends of the body and the chassis frame or the chassis frame shall be suitably bent to provide support to the body at the wheel ends. The arrangement shall, however not prevent tipping of the wheelbarrow over its wheels, when so required to empty its contents.

The underside of the handle ends shall be not less than 50cm and the top edge of the body not more than 60cm above the ground level when the legs are resting on the ground.

The distance between both the handles (outer to outer) shall be not less than 50cm and not greater than 55cm. The ends of the handles shall be provided with firm comfortable and non-slip grips.

The shape and construction of the chassis and body shall ensure stability of the wheelbarrow when the legs are resting on ground or when the wheelbarrow is in motion under normal working conditions.

Wheels

The wheels shall be constructed of mild steel or cast iron and shall be of disk type or any other suitable design to ensure adequate strength. The wheels shall be fitted with metal rims, or solid or cushioned rubber tyres.

The diameter of the wheels shall be not less than 300mm and the nominal width of the tyre shall be not less 50mm.

Painting

The whole wheel barrows should be sand blasted prior to painting. The outside & inside of the containers to be coated with one coat of zinc rich primer. The internal surface shall be coated with two coats of bitumenistic epoxy paint while the external surface shall be painted with two coats of synthetic enamel paint to ensure long life suitable for use of handling raw garbage under corrosive conditions. The paint shall be ICI / Asian / Johnson & Nicholson. / Burger and colour shade shall be as specified by the purchaser.

Axle

The axle shall be fixed to the chassis frame and the bearings shall be located inside the wheels hubs which will revolve over the axle.

The axle shall be not less than 25mm in diameter and the bearings length shall be not less than 25mm at each end. The journal portion of the axle shall be machined to appropriate tolerances and the allowance, and the surface finished to ensure uniform bearing contact. The material for axle shall conform to IS: 226-1975 for bronze bearing bushes.

Bearings

The bearings shall be so designed that there is no side play in the movement of the wheels. The bearings shall consist of bronze bearing bushes or any other suitable bearings of equivalent properties.

The internal diameter of bore of the bearing shall be such that the clearance between bearing and the axle is not more than 0.5mm.

The bearing walls shall be of adequate thickness preferably not less than 5mm to avoid premature wear and giving way of bearing under load.

Suitable arrangement shall be provided to facilitate proper lubrication of bearings.

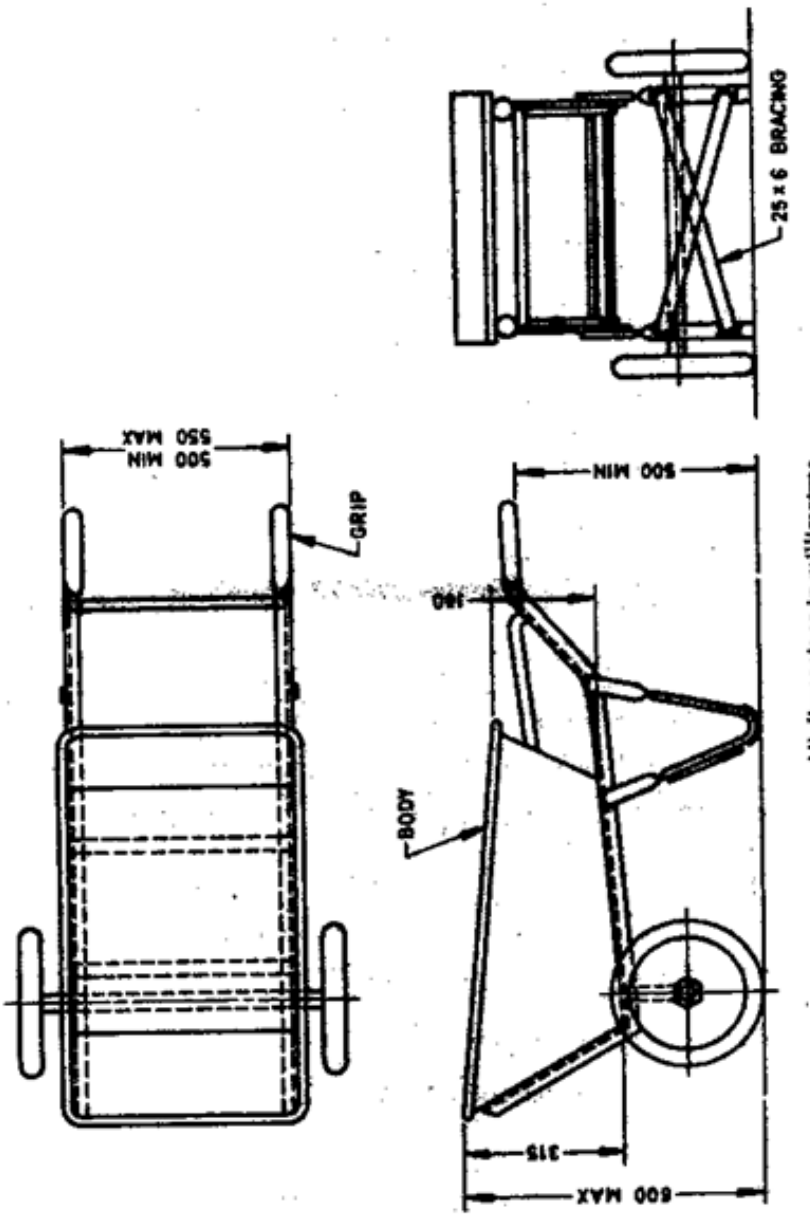
Accessories

Following additional accessories, shall be provided with each Wheel Barrow/seamless hand cart.

long handle broom: length of broom 80-85cm,weight of broom1kg,binding material20 gauge ms sheet ring having width of 1.5-2 cm , handle of broom bamboo of 135 cm length and 3-4cm dia. Weight of the handle 0.9kg,

collection plate : length325mm,widthfront 300mm,widthrear 250mm,22gauge of ms sheet.

Metal plate: 100x250 mm sheet of 20 gauge



All dimensions in millimetres

FIG. 1 TYPICAL SKETCH OF WHEELBARROW (WITH TWO WHEELS)

4. Mini Garbage Collector and Auto Tipper

General:

The four wheeler Tempo type Closed Garbage High Lift Tipper should be useful for door to door collection & transportation of municipal waste, silt, grit or any other waste from the collection point to its disposal point/ directly unloading into the compactor/ container. The body capacity should be minimum 1.8 Cum (comprising of 1.5 cum for garbage with

hydraulically unloading arrangement into compactor/ bin and 0.3 cum capacity for storage of recyclable waste for manual/ gravitational unloading). The garbage container of 1.5 cum capacity should be hydraulically operatable and compatible with bins/ compactor. The unit should consist of:

- The hydraulic System should operate by battery operated via 12 V Power Pack/ engine driven hydraulically pump
- Fully Enclosed Tipper with two openable lids at the top for collection of waste.
- Hydraulic arrangement for unloading
- Under body Hydraulic System
- Pendant switch/ DC valve for tipping operation as per requirement
- The complete tipping system should be designed to suit chassis units, which consists of a body with suitable frame.

Chassis:

GVW: Minimum 1600 Kgs.

Container Capacity: 1.8 Cum.

Wheel Base : Minimum 2100 mm

Max output : Minimum 16 Hp @ 3200 rpm

Torque: Min. 3.5 mtr. / kg @ 2000 rpm

Displacement : Minimum 700 cc

Suspension : Parabolic leaf spring at both front and rear.

Fuel Tank : 30 litre

Overall Dimension : Minimum 3800 x 1500 x 1800 mm

Gear box : Synchromesh (4 forward) and sliding mesh (one reverse)

Clutch : Single plate dry friction diaphragm type

Prime Mover:

The source of supply to be from the battery operated by Power Pack (150 Amp 12 V)/ engine driven hydraulic pump

Unloading arrangement:

Hydraulic cylinder with scissor/ any other suitable mechanism.

Tipping angle 60 degree (flat floor)

Frame:

The sub frame should be all welded construction of rectangular hollow section, reinforced adequately on the load members, mounted on chassis with nuts and bolts.

Tipper Body (Container):

Tipper Body should be all welded construction of sheet metal adequately reinforced by the stiffners having formed ribs on the floor of the container.

Dimension of container : Length = 2750 mm, Width = 1500 mm, Height : 1000 mm

Total Height from the ground – 1500 mm

Loading Height – 1250 mm

Unloading Height – 1100 mm

Driver's Cabin:

The machine should be provided with company fitted all weather Steel Driver's Cabin with excellent operator all around visibility. Pendant Switch must be fitted in the cabin as red and green push buttons for tipping and lowering operations.

Body Prop:

Body Prop should be provided to support the body for servicing purpose and safety purpose. The Hydraulic System should operate on the Power Pack/ engine driven hydraulic pump, which should source the supply from the vehicle battery itself i.e. 12V or by engine.

Hydraulic Valves:

A suitable Relief Valve should be provided for the protection of overloading.

Hydraulic Cylinders:

All cylinders must be tested at 1.5 times the rated working pressures. Cylinder rods of all cylinders should be constructed of high strength hardened steel rods and should be hard chrome plated. Where necessary, pin mounting connections of cylinders should incorporate hardened spherical bushings on hardened pins. The cylinders should be of reputed make and should adhere to dimension given in technical schedule.

Hydraulic Tank and Filters:

The Hydraulic Oil Tank (capacity minimum 15 liter) should be fitted with Suction Strainer to ensure the supply of clean hydraulic oil, Air Breather, Oil Filter and Oil level indicator.

Accessories

Mud Guard – 04 nos.

Mud Flap - 04 nos**.**

The Manufacturer/Supplier should provide following with each vehicle:

i. Two copies of Operator's manual

ii. Two copies of Workshop & service manual

iii. Two copies of Spare parts cataloque operation manual

iv. Warranty card for one year.

v. Battery warranty card for 1 year

vi. Manufacturer's standard tools for maintenance with lockable security box

Warning System and Essential Accessories:

(a) Speedometer

(b) Engine oil pressure gauge or warning light

(c) Fuel level gauge

(d) Water temperature gauge

(e) Ammeter or warning light

(f) Horn – 2 pieces

(g) External rear view mirrors

(h) Radiator protection grill

(i) Head and tail lights, cabin lights,

(j) Reversing alarm/beeper system

(k) Spare wheel with tyre and inner tube with wheel carrier.

(l) Jack and wheel wrench

(m) Anti- theft steering lock

Painting and writing:

The entire unit should be painted with two coats of superior quality anti-corrosive primer with two coats of approved quality paint. The bidder should get the colouring paint/ name & slogan writing approved from the client.

Drawings:

The bidder should provide drawings of the Goods/Equipment proposed with the bid and the selected bidder would be required to submit the working drawing for approval of the Purchaser at time of Contract execution.

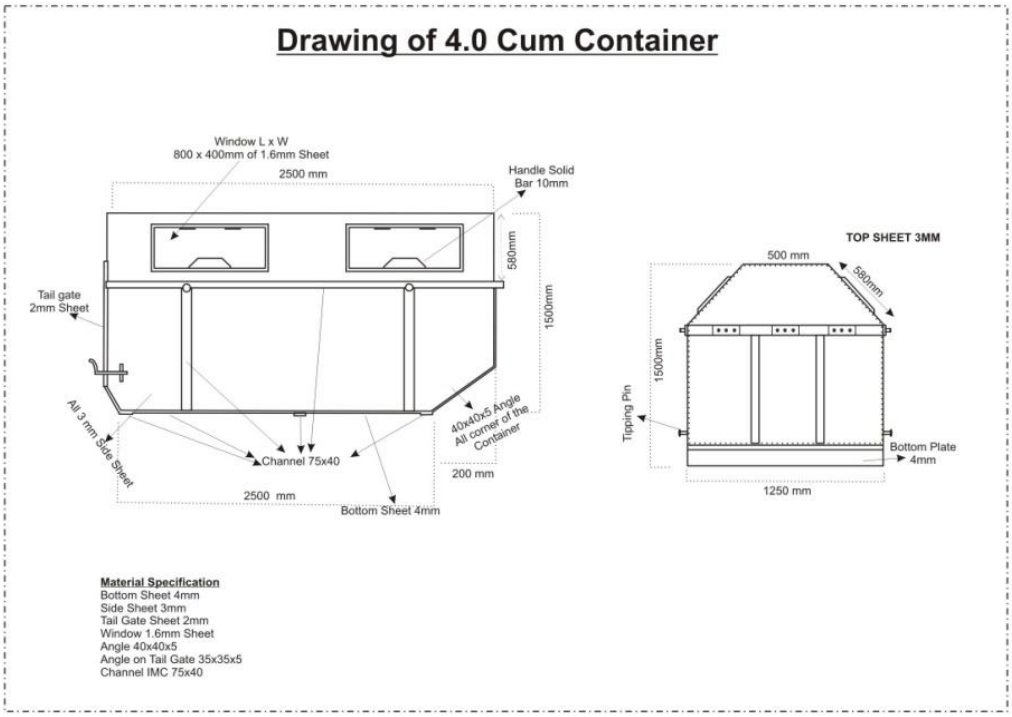
5. Secondary Storage containers of 3.0 Cubic metre

The container having compatibility with the Dumper Placer Carrier Vehicle shall be closed type having minimum capacity of 3.0 Cum. The vertical height of long side of the container (dumping sides) should not be more than 1.10 meter and maximum height of the top of the container should not be more than 1.50 meter. The sides of container shall be fabricated out of 3.15 mm thick MS sheet and bottom out of 5 mm thick MS sheet. The rear door shall be fabricated out of 2.5-mm MS sheet and fixed to the container with heavy-duty hinges. The container should have mechanical locking arrangement for preventing falling of waste during transit.

Minimum 4-side opening doors of size 700 mm x 400 mm each to be provided to dump the garbage. These shall be fabricated out of 2-mm thick MS sheet and fixed to the

container with heavy duty hinges and having handles made out of 12-mm round steel bars.

All sides of the containers should be properly reinforced with IMC 75 mm x 40 mm and ISA 40mm x 40mm x 5mm and should have continuous welding. The entire surface shall be first cleaned by sand blasting or any other appropriate method and given a coat of anti- corrosive primer. Bituminous or any other anti-Corrosive paint shall be applied to the inside surface of the container and outside surface of the container finished with two or more coats of synthetic enamel paint of desired shade and color. The container should have suitable arrangement for lifting, emptying & placing on vehicle.



6. Twin Bin Dumper Placer for 2.5 cum capacity containers

General Description

The Dumper Placer/ Carrier Vehicle (Chassis and Cab) shall be rugged and durable, shall incorporate the latest technological features offered by the manufacturer/supplier. The truck chassis shall support hydraulically operated hoisting mechanism to load, offload and tip the twin containers of 2.5 cum capacity. The dumper placer shall comprise of two pairs of lift arms each actuated by double acting high pressure rams, manually operated tipping hooks, hydraulic ball & plate type stabilizers and hydraulic system duly mounted on truck chassis with cab & PTO. Lifting arrangement shall be on the sides of the vehicle.

The equipment shall confirm to the following requirements:

Basic specification:

Complete chassis kerb weight with cab only (with spare wheel and tools) shall be as per IS 9211.

a) Make: Tata/Ashok Leyland/Eicher/Force

b) GVW: Not less than 7200 Kg.

c) Engine: Euro IV, Turbo charged, minimum 85 HP

d) Clutch : Single Plate dry friction type

e) Gear Box: Synchromesh type

f) No. of gears: 5 forward and 1 reverse.

g) Frame: Ladder type heavy duty frame with welded/ riveted/bolted cross members, side members of channel sections /as per CMVR / ARAI approval.

h) Suspension: Semi elliptical leaf spring at front and rear with auxiliary springs at rear only.

i) Cab: All steel, semi forward / full forward control driver's cab. Cabin should have minimum two nos. foam padded adjustable seats with seat belts. Cab should have all standard accessories provided by the chassis manufacturer and required under Motor Vehicles act.

j) Painting : Complete truck chassis along with dumper placer mechanism and the platform shall be thoroughly cleaned as per standard industrial practice and then applied with primer paint followed by two coats of automobile grade Paint of colour shade specified by the purchaser.

Hydraulically-operated hoisting mechanism:

Main frame: Main frame shall be box type, made from pressed steel sections mounted on vehicle chassis through rolled mild steel channel sub-frame.

Rear end: It shall be aesthetically pleasing and provide greater ground clearance using fix geometry for stabilizing arm movement.

Bed: The bed shall be made with adequate number of horizontal and longitudinal ISMC sections. 3-mm thick MS sheet shall be welded on top of the frame.

Boom rams: Two sets of double acting type boom rams suitable to handle twin containers shall be provided. The cylinders shall be of minimum 100-mm dia.

Boom arms: Two heavy-duty booms, having length as per design requirement of the equipment and complying with CMVR. These booms should be of welded construction.

Cylinder Guards: Cylinder guards shall be provided along the chassis length to protect lifting cum tipping cylinders on either side of the chassis.

Stabilizers: Two nos. independently controlled stabilizers, ball and plate type operating through hydraulic cylinder shall be provided to keep the vehicle leveled even on un-even surface and to balance the vehicle during loading/ unloading of containers.

Hydraulic Cylinders : Hydraulic cylinders shall be manufactured out of Tubes confirming to DIN standard and shall have adequate capacity to undertake loading/unloading of containers 20 cum capacity when full and stabilizers without any adverse effect on the dumper placer or failure of cylinders.

Control Valve

Spool Type hydraulic control valve is to be provided for all operations with levers accessible from driver's seat in the cabin for easy & comfortable operation. All spools should be self centring type. A pressure relief valve is to be provided in the hydraulic circuit.

7. Twin Bin Dumper Placer for 3.0 cum capacity containers

General Description

The Dumper Placer/ Carrier Vehicle (Chassis and Cab) shall be rugged and durable, shall incorporate the latest technological features offered by the manufacturer/supplier. The truck chassis shall support hydraulically operated hoisting mechanism to load, offload and tip the twin containers of 3.0 cum capacity. The dumper placer shall comprise of two pairs of lift arms each actuated by double acting high pressure rams, manually operated tipping hooks, hydraulic ball & plate type stabilizers and hydraulic system duly mounted on truck chassis with cab & PTO. Lifting arrangement shall be on the sides of the vehicle.

The equipment should confirm to the following specifications.

Basic specification:

Complete chassis kerb weight with cab only (with spare wheel and tools) shall be as per IS 9211.

a) Make: Tata/Ashok Leyland/Eicher/Force

b) GVW: Not less than 7800 Kg.

c) Engine: Euro IV, Turbo charged, minimum 90 HP

d) Clutch: Single Plate dry friction type

e) Gear Box: Synchromesh type

f) No. of gears: 5 forward and 1 reverse.

g) Frame: Ladder type heavy duty frame with welded/ riveted/bolted cross members, side members of channel sections.

h) Suspension: Semi elliptical leaf spring at front and rear with auxiliary springs at rear only.

i) Cab: All steel, semi forward / full forward control driver's cab. Cabin should have minimum two nos. foam padded adjustable seats with seat belts. Cab should have all standard accessories provided by the chassis manufacturer and required under Motor Vehicles act.

j) Painting: Complete truck chassis along with dumper placer mechanism and the platform shall be thoroughly cleaned as per standard industrial practice and then applied with primer paint followed by two coats of automobile grade Paint of colour shade specified by the purchaser.

Hydraulically-operated hoisting mechanism:

Main frame: Main frame shall be box type, made from pressed steel sections mounted on vehicle chassis through rolled mild steel channel sub-frame.

Rear end: It shall be aesthetically pleasing and provide greater ground clearance using fix geometry for stabilizing arm movement.

Bed: The bed shall be made with adequate number of horizontal and longitudinal ISMC sections. 3-mm thick MS sheet shall be welded on top of the frame.

Boom rams: Two sets of double acting type boom rams suitable to handle twin containers shall be provided. The cylinders shall be of minimum 100-mm dia.

Boom arms: Two heavy-duty booms, having length as per design requirement of the equipment and complying with CMVR. These booms should be of welded construction.

Cylinder Guards: Cylinder guards shall be provided along the chassis length to protect lifting cum tipping cylinders on either side of the chassis.

Stabilizers: Two nos. independently controlled stabilizers, ball and plate type operating through hydraulic cylinder shall be provided to keep the vehicle leveled even on un-even surface and to balance the vehicle during loading/ unloading of containers.

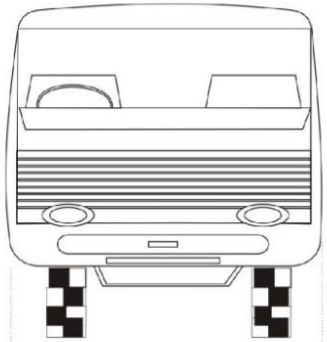
Hydraulic Cylinders : Hydraulic cylinders shall be manufactured out of Tubes confirming to DIN standard and shall have adequate capacity to undertake loading/unloading of

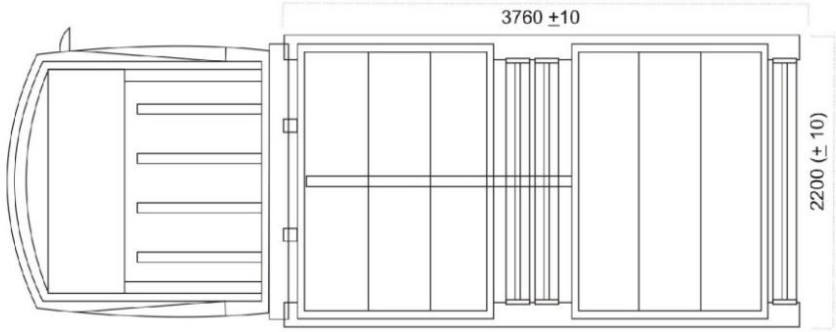
containers 20 cum capacity when full and stabilizers without any adverse effect on the dumper placer or failure of cylinders.

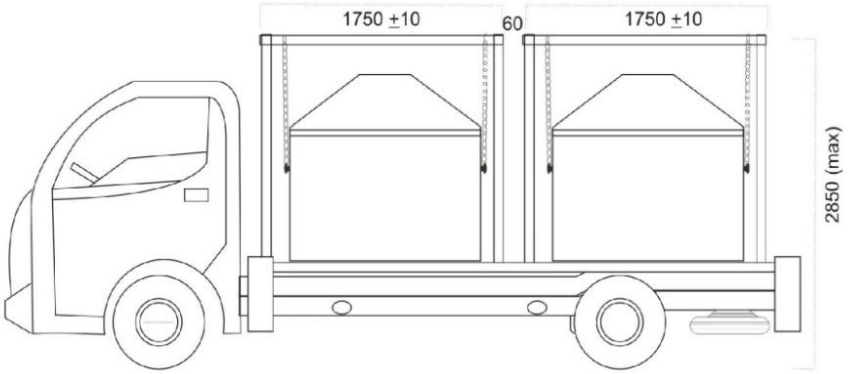
Control Valve

Spool Type hydraulic control valve is to be provided for all operations with levers accessible from driver's seat in the cabin for easy & comfortable operation. All spools should be self centering type. A pressure relief valve is to be provided in the hydraulic circuit.

DRAWING OF TWIN DUMPER PLACER OF 4 CUM CAPACITY (EACH)







NOTES :	
BOOM RAMS	110 Bore : 4 Nos. Double Acting
BOOM ARMS	Box Section 150mm X 75 mm 4mm Thick
FLOOR SHEET	3mm Thick

MAIN PRODUCT

Carrier Vehicle for 2 x 4 Cum Capacity Container

8. Truck with hydraulic lift for Transportation of Solid Waste 10 cum. Capacity

Truck chassis shall be TATA/ ASHOK LEYLAND/ EICHER/ FORCE make.

General Description

The Tipping Truck shall be rugged and shall incorporate latest technological features offered by the manufacturer. The vehicle shall be suitable for use to load around 10 cum garbage/ debris/ waste at transfer station/compost plant, transport to landfill and unload it by tipping or by any other suitable arrangement. The vehicle should have provision to transport the garbage in covered and packed condition. Hydraulically operated covers are to be provided in such a manner that the top of load body remain fully open at the time of loading of garbage, whereas it is fully covered during transportation.

The equipment shall confirm to the following specifications.

Truck Chassis

Gross vehicle weight:	Minimum 16000 Kg.
Engine:	min. 120 HP (appox.) at rated RPM. BS-IV Model
Gear Box:	Synchromesh type
No. of gears:	5 forward and 1 reverse.
Wheel base :	minimum 3600 mm

The truck chassis shall be suitable to handle the specified load provide satisfactory service envisaged and shall comply with all provisions of Motor Vehicles Act and MSW rules 2000.

Load Body

Load body shall be Rugged and suitable to carry 10 cum garbage with hydraulically operated top to load garbage from top and cover garbage during transportation. It should have provision of hinged tail gate to unload the garbage by tipping the load body or by any other suitable arrangement. Three stage Tipping cylinder at front end shall be provided with tipping angle 45 degree. The tail gate should have suitable locking mechanism. Body dimensions shall be (approx.) length-3850mm,Width-2315mm,Height-1125mm. Floor shall be made with minimum 4mm MS sheet and Side panel with minimum 3mm MS Sheet.

Cabin

All steel semi/Fully forward control driver's cab. Cabin should have minimum two nos. foam padded adjustable seats with seat belts. Cab should have all standard accessories provided by truck chassis manufacturer and shall confirm to requirements of Motor Vehicles Act.

Painting: The body should be sand blasted prior to coating/painting. The body shall be coated with one coat of zinc rich primer & then with two coats of synthetic enamel paint to ensure long lasting structure suitable for use under hostile conditions. Colour shade/make of paint shall be as specified by the purchaser. The logo of concerned ULB, capacity of equipment and any other information asked by the purchaser shall be painted on the body.

The paint shall be of good quality and ICI / Asian / Johnson & Nicholson / Burger make.

GAD

General Arrangement Drawing of the equipment including all dimensions and make of all accessories/bought out items shall be submitted to purchaser for approval.

9. Truck with hydraulic lift for Transportation of Solid Waste 5 cum. Capacity.

Truck chassis shall be TATA/ ASHOK LEYLAND/EICHER/FORCE make.

General Description

The Tipping Truck shall be rugged and shall incorporate latest technological features offered by the manufacturer/supplier. The vehicle should be suitable to be used to load around 5 cum garbage/ debris/ waste at transfer station/compost plant, transport to landfill and unload by tipping the load body or by any other suitable arrangement. The vehicle should have provision to transport the garbage in covered and packed condition. Hydraulically operated covers are to be provided in such a manner that the top of load body remain fully open at the time of loading of garbage and it is fully covered during transportation.

The equipment shall confirm to the following specifications.

Chassis

Gross vehicle weight:	Minimum 9600 Kg.
Engine:	min. 90 HP appox. at rated RPM BS-III Model.
Gear Box:	Synchromesh type
No. of gears:	5 forward and 1 reverse.
Wheel base :	minimum 2770 mm

The truck chassis shall be suitable to handle the specified load provide satisfactory service envisaged and shall comply with all provisions of Motor Vehicles Act and MSW rules 2000.

Load Body

Rugged and suitable to carry 5 cum material with hydraulically operated top to load garbage from top and cover during transportation. It should have provision of hinged tail gate to unload the garbage by tipping the load body or any other suitable arrangement. The tail gate should have suitable locking mechanism. Body dimensions approx length -3400mm, Width - 2040mm, Height - 710mm, Floor shall be made from 4mm (min.) MS sheet, and Side panel from MS plat 3mm (min.) thick.

Cabin

All steel semi/Fully forward control driver's cab. Cabin should have minimum two nos. foam padded adjustable seats with seat belts. Cab should have all standard accessories provided by truck chassis manufacturer and shall confirm to requirements of Motor Vehicles Act.

Painting: The body should be sand blasted prior to coating/painting. The body shall be

coated with one coat of zinc rich primer & then with two coats of synthetic enamel paint to ensure long lasting structure suitable for use under hostile conditions. Colour shade/make of paint shall be as specified by the purchaser. The logo of concerned ULB, capacity of equipment and any other information asked by the purchaser shall be painted on the body. The paint shall be of good quality and ICI / Asian / Johnson & Nicholson / Burger make.

GAD

General Arrangement Drawing of the equipment including all dimensions and make of all accessories/bought out items shall be submitted to purchaser for approval.

10. TRACTOR, TROLLEY AND WATER TANKER

Technical Specifications

The technical specifications of the equipment required by the purchaser are indicated in preceding paragraph. The Bidders shall complete the technical specifications for the Goods offered in their entirety so as to demonstrate their compliance with the requirements of the bidding documents

General:

Tractor, trolley and water tankers shall be used for day to day multi activities by the municipal authority.

Tractor

General:

The Tractor should be rugged and durable, and designed for ease of manoeuvrability and proper distribution of tractor, and axle induced stresses. The frame/chassis should be either fully welded or rigidly bolted to achieve this, in accordance with the manufacturer's standard procedures. It should be suitable for working under adverse site conditions, and the power train should be designed for this purpose.

Basic Specification:

a) Type: tractor complete with trolley attach ment provision.

b) Structure: Rugged, fully welded, durable and designed for durability and proper distribution of induced stresses.

c) Engine: Minimum Euro 2, fuel efficient, Turbo charged, 4 stroke OHV direct injection diesel engine. Minimum Gross Horsepower Rating : 35 HP (27 KW) at manufacturer's rated RPM.

d) Cylinder: Minimum three cylinders vertical in line – 3 Cylinder DI Engine with Integral

cylinder head.

e) Fuel Injection: In line fuel injection pump with variable speed mechanical governor.-

Mechanical.

f) Fuel System : Gravity and forced feed, Fuel tank capacity not less than 30 liters and fuel filtration should be dual stage.

g) Air Cleaner: should be of oil bath type with cyclone type transparent pre-cleaner.

h) Lubrication: Forced feed and splash type with full flow filter paper element

i) Cooling: Impeller type water pump, fan and radiator, forced feed water circulation.

j) Compression Ratio: More than 17:1

k) Transmission : 8 forward and 2 reverse gears

l) Clutch: Single/Double plate dry friction type

m) Gear: 4 forward and 1 reverse

m) Steering: Worm and nut type with re-circulating balls

n) Brakes : Shoe/Disk Type, Emergency brakes: hand brake with parking latch

o) Electric System : Voltage: 12 volts, Battery capacity: 12 volts, 60 Amps/hr @ 5 hr rating, Alternator capacity: minimum 12 volts 13 Amp, Head lights: 2 nos. 12 V -36 W, Brake light: 2, nos. 12 V-21, Rear light: (Plough lamp) -01

p) Instrument Panel: it should have tachometer and hour meter,water temperature gauge,oil pressure gauge,ampere meter,fuel gauge, high beam indicator,left and right turn indicators,hazard warning switch,hand and foot accelerator etc.

q) Seat: longitudinal adjustable with back rest and hydraulic shock absorber.

r) Wheel and Tyres: No. of wheels: Front: 2, Rear: 2.

s) Hydraulics: Hydraulic system with ADDC, single acting cylinder position and mixed Control, provision for external circuit for double acting cylinders.

t) Painting: Paint process and paint should be superior quality to ensure long lasting structure resistant to rust, weathering and breakage. The bidder should get the colouring paint/ name & slogan writing approved from the purchaser.

u) After Sales Support :

- Free service in the first year with a warranty for the machine for 1 year from the date of
- Commissioning.
- To demonstrate capabilities of giving proper service and spaces after the expiry of warranty period.

- Should be capable of proposing maintenance contract for subsequent years at respective ULBs.

The Manufacturer/Supplier should provide following with each vehicle:

(a) Manufacturer's standard tools for maintenance with lockable security box.

(b) Operator's manual

(c) Workshop and service manual

(d) Spare parts catalogue

(e) Technical details, drawing and operation manual

(f) Warranty card for one year

(i) Battery warranty card for 1 year.

Warning System and Essential Accessories:

(a) Digital Hour mete

(c) Fuel gauge

(d) water temperature gauge

(e) Engine oil pressure gauge with warning light

(f) Ammeter supported with warning light

(g) Horn- 2 pieces

(h) External rear view mirrors

(I) Radiator protection grill

(j) Head and tail lights, cabin lights, reversing light and traffic indicator

(k) Spare wheel with tyre and inner tube

(l) Jack and wheel wrench

(m) Anti-theft steering lock

(p)Speedometer

The following genuine obligatory spares to be supplied along with each equipment:

- Oil Filter - 3 no.
- Diesel Filter Primary - 3 no.
- Diesel Filter Secondary - 3 no.
- Hub, Packing - 4 no.
- Rear Wheel Oil seal - 4 no.
- Split Pin - 4 no.
- Fuse - 3 no.
- Bulb - 2 no.
- Wheel Nut - 4 no.
- Tapper covers packing -2 no.
- Air cleaner rubber - 2 no.
- F.I.P. packing - 1no.
- Air Breather - 1no.
- Gaskit elbow -1no.

Drawings:

The bidder should provide drawings of the Goods/Equipment proposed with the bid and the selected bidder should submit the working drawing for approval of the Purchaser during Contract execution.

Tractor Trolley

General:

The Tractor trolley should be rugged and durable, and designed for ease of manoeuvrability and proper distribution of tractor, and axle induced stresses. Tractor drawn Tipping Trolley should have box type load body having minimum 3 cum capacity, suitable to transport and unload up to 3 tones for all types of road gradient.

Basic Specification

a) Type: Trolley complete with proper attach ment provision with tractor.

b) Structure: Rugged, fully welded, durable and designed for durability and proper distribution of induced stresses.

c) Main Chassis: I SMC 150x75 mm channel - 1 set.

d) Sub Frame: ISMC 125x65 mm - 2 Nos.

e) Hitch Beam: Fabricated from MS plate- press formed and welded I SMC channel 1 No.

f) Cross Member: I SMC 75x40 mm channel -10 Nos.

g) Eye Hitch: Forged steel and heat treated– 1 No.

h) Rear Doors: 3.00 MM HR sheet with reinforcement of 75x40 ISMC

i) Axle: EN -8 – 63 mm sq.

j) Wheels: Ring Type – 8mm thick – 2 Nos.

l) Breaks: Parking breaks – 1 set

m) Tyres: 900x20-16 ply – 2 Nos. of standard make (approved by purchaser)

n) Hydraulic Jacks: Single ram 5 - ton capacity hydraulic jack with minimum tipping angle of 50 degree

Painting and Lettering:

The entire surface should be first cleaned by sand blasting or any other appropriate method and given a coat of anti corrosive primer. Bituminous or any other anticorrosive paint shall be applied to the inside surface of the body, whereas outside surface shall be finished with two or more coats of Air drying enamel paint of desired shade and color as approved by purchaser. The bidder should get the colouring paint/ name & slogan writing

approved from the purchaser.

Drawing:

The bidder should provide drawings of the Goods/Equipment (including openable cover)

proposed by them with his bid and the selected bidder should submit the working drawing for approval of the Purchaser during Contract execution.

Water Tanker 4000 Liter Capacity

General:

The wáter tanker of capacity 4000 liters shall be suitable for connecting with the tractor and compatible with the tractor. It shall be rugged, durable and shall incorporate latest technological features.

Basic Specification

The Chassis of the wáter tanker should be perfectly capable and suitable for mounting water tank of capacity 4000 liters, water pump and hosepipe and hose real etc. Turning radius of vehicle should not be more than 6 meters. Water Tank shall be fabricated out of 3.15 mm thick M.S. Sheet elliptical in shape of suitable dimension compatible with chassis to be supplied by the bidder over which the tank is to be mounted.

The tank shall have 2 compartments of equal capacity. Both compartments will be interconnected at bottom. Each compartment shall be provided with air vent pipe of size 50 mm and a 450 mm size manhole with hinged coverlid and locking arrangements. Internal partitions shall be made of 3.15 mm thick M.S. sheet reinforced by 35 X 35 X 5 mm thick angles. The tank shall have dished faces at both the ends. Ladders made of 16 SWG conduit pipe will be provided to have access to the manhole and to get into the tank. Water level indicator of vertical conduit type with vertical slit opening containing a float indicator will be provided in the tank. Two outlets one number of 3” size and another of 2” size fitted with Gunmetal gate valve for connecting with the pump suction shall be provided.

Diesel Engine driven Pump: 5 HP water pump operated by the diesel engine of tractor shall be installed at each water tanker. There should be provisión of connection of pump with the tractor engine by a suitable shaft and gear.

Hose Pipe: Hose pipe shall be of good quality canvas hose of reputed make of size equal to diameter of pump delivery and 6 meters long ISI marked suitable for connecting to the delivery of water pump.

Painting and Lettering:

The entire frame to be painted with powder coating of color approved by purchaser. Lettering /slogan writing as approved by purchaser.

Drawing:

The bidder should provide drawings of the Goods/Equipment proposed by them with his bid and the selected bidder should submit the working drawing for approval of the Purchaser during Contract execution.

11. Loader Backhoe

General Description

The Loader Backhoe shall be rugged with proper distribution of loader, backhoe and axle induced stressed. The frame/chassis shall be fully welded/ bolted. The machine shall comprise of diesel engine of 96 HP (appox) with Turbocharger, excavator bucket, multi-purpose bucket and with standard cabin with provision of helper to sit. The machine should be capable to perform various works like excavation, loading, garbage spreading, dozing etc. It will be used for various miscellaneous municipal works.

Basic Specification

The Excavator Loader shall meet following specifications:

Gross Vehicle Weight: Minimum 7500Kgs

Engine: 96 HP (appox). at rated RPM. BS-III Model.

Max Torque: 36 Kg-m ± 2 Kg-m, Battery: 12 V.

Hydraulic Pump Gear type: 210 bar pressure and Flow 100 Lpm (min).

Final Drives: 4-wheel drive with electrical operation 2-WD to 4WD

Steering: Hydrostatic power steering and manual in the event of engine or hydraulic power failure.

Transmission: Fully synchromesh gear box with 4 speed and 3/4 speed reverse,
Excavator Bucket: Excavator bucket of 0.24cum capacity with locking/bolted teeth and side cutters suitable with extending dipper extended up to 1 meter when compared with standard one.

Ground Reach from slew centre: min. 6.0 m

Digging Depth: min. 5.4 m

Slew Ground Clearance: min. 0.35 m

Bucket Digging Force: min. 5500-kgf

Dipper tear out force- min. 3000kgf.

Loader Bucket: 6-in-1 type multipurpose bucket (with bolt type teeth) having 0.98 cum capacity and capable to do digging, dozing, grabbing, grading, loading and spreading.

Dump Height: min. 2.6-m

Load Over Height: min. 3.2-m

Loader arm break out force- min. 3750kgf.

Maximum reach at full height: min. 0.8-m

Lift capacity to full height: min. 2600kgs.

Dumping angle: more than 40 degree.

Cabin: All round visible cabin confirming ROPS and FOPS standards. Cabin should provide easy two door access with plenty of leg room to allow operator to work un-interruptedly for long hours. Instrumentation panel on right-hand-side with audio & visual indicator & alarm systems. Fully adjustable operator seat with high back. Safety belts. Toolbox cum cushion seat to accommodate operator and all direction face fan inside cabin. Minimum two fixed and two rear adjustable light outside cabin for illumination.

Painting:

The body should be sand blasted prior to coating/painting. The body shall be coated with one coat of zinc rich primer & then with two coats of synthetic enamel paint to ensure long lasting structure suitable for use under hostile conditions. Colour shade/make of paint shall be as specified by the purchaser. The logo of concerned ULB, capacity of equipment and any other information asked by the purchaser shall be painted on the body. The paint shall be of good quality and ICI / Asian / Johnson & Nicholson / Burger make.

GAD

General Arrangement Drawing of the equipment including all dimensions and make of all accessories/bought out items shall be submitted to purchaser for approval.

12. Skid Steer Loader

Technical Specifications

The technical specifications of the equipment required by the purchaser are indicated in preceding paragraph. The Bidders shall complete the technical specifications for the Goods offered in their entirety so as to demonstrate their compliance with the requirements of the bidding documents

General	Wheel mounted diesel operated
Engine	Turbocharged 4 stroke
Gross Power	minimum 50 hp
Net Power	minimum 46 hp
Displacement	134 in3
Operating Specifications	
Rated Operating Capacity	Min. 1320 lb (599.28 Kg)
Minimum Tipping Load	2600 lb (1180 Kg)
Weights	
Min. Operating Weight	5600 lb (2542.4 Kg)
Dimensions	
Wheelbase	min. 39 inch (990 mm)
Length w/Bucket on Ground	126 to 138 inch (3200 to 3505 mm)
Length w/o Bucket	94 to 102 inch (2387 to 2591 mm)
Height to Top of Cab	max. 78 inch (1982 mm)
Vehicle Width over Tires	max. 67 inch (1702 mm)
Bucket Pin Height at Max Lift	minimum 112 inch (2845 mm)
Reach at Max Lift and Dump	minimum 20 inch (508 mm)
Clearance at Max Lift and Dump	minimum 82.6 inch (2098 mm)
Maximum Dump Angle	40°
Turn Radius from Ctr – Rear	minimum 59 inch (1498 mm)

Max. Reach w/Arms-Parallel	minimum 51 inch (1295.4 mm)

Hydraulic System

Hydraulic Flow	Standard
Loader Hydraulic Pressure:	minimum 3000 psi
Hydraulic Pump Flow cap.	Minimum 16 gal/min
Hydraulic Power	minimum 30 hp

Power Train

Travel Speed Forward:	6.8 to 11 kmph

Service Refill Capacities

Fuel Tank	minimum 16 gal (72 liter)
Hydraulic Tank:	minimum 8.7 gal (39 liter)

Name and Logo

- Name and Logo of respective Nagar Nigam/ Panchayat shall be painted on the body so that it is clearly visible at all time.
- Logo of “Samvardhan” if desired by the purchaser shall be painted on the body at suitable place

General Arrangement Drawing (GAD)

After signing of Contract; General Arrangement Drawing (GAD) and Data Sheets of the equipment showing all dimensions, specifications and make of all accessories/ bought out items shall be submitted to purchaser for approval.

13. Weigh Bridge for weighing of Solid Waste at Land-fill Sites

1.0 **Basic Specifications:**

a) **Machine Type:** Electronic Weighbridge – Pit Mounted

b) **Capacity:** 50 MT, with Least Count of 10 Kg.

c) **Platform Size:** 9000 X 3000 mm

d) **Steel Structure:** Minimum of 6 No. Girders of size 400 X 140 mm, with Top Plate 12 mm Thick of MS sheet & having chequered design on top to avoid skidding. All the girders shall be supported on 2 No. fabricated transoms.

Load Cells Details:

e)
- No. of Load Cells : 04 (of capacity 30 MT each)
- Type : Compression Type
- Output : Digital

- Accuracy : 6000 Divisions (OILM R60)
- Output Updates : 10 Readings Per Second
- Non Linearity : +/– 150 ppm (Max)
- Repeatability : 80 ppm
- Overload Rating : 350% (Ultimate)
- Protection Class : IP68

f) **Electronic Display Unit:**

- Type of Display : Digital, Cobalt Blue, Backlit, Graphical
- Key Board : Alpha–Numeric
- Heights of Digits : 24 mm (Minimum)
- Date and Time : Real Time Clock should be available
- Tare : 100%
- Error Indication : Should be indicative of display itself
- Communication Part : RS232 for interfacing with the Computer
- Password Protection : Should be available

g) **General:** Fully Electronic, with P-IV (min)Computer, Coloured Monitor 15'', 80 Column Dot Matrix Printer, Digitizer with one inch display & RS-232 serial communication, necessary software as per requirement, additional remote display unit, 5 KVA UPS with 8 hours battery backup.

2.0 **Civil Works:** All civil works for installation of weigh bridge such as foundation, ramps, etc. except weighing record room shall be part of weigh bridge supply.

3.0 **Warranty:** The equipment shall have a minimum warranty of three years including the warranty for Load Cells.

4.0 **Stamping:** The supplier will get the stamping done of the Weigh Bridge from Weights & Measurement Department of the State initially as well every year during warranty period

5.0I**nstallation**: The weigh bridge will be installed and commissioned to the satisfaction of the purchaser.

14. Vehicle mounted combined sewer cleaning suction cum jetting machine of 8500 liters:

General

The Sewer cleaning suction cum jetting machine shall consist of a twin compartment tank of 8500 litres capacity alongwith suction pump and a jetting pump. The tank shall be divided in two compartments of 5000 litres for fresh water and 3500 litres for Sludge/ sewage. The complete equipment shall be mounted on a truck chassis of GVW not less than 16 tons and an engine Horse Power rating of not less than 120 HP. The high power jetting system shall be provided to dislodge/ clear the obstructions/ chokages from the application point. The equipment should be capable of sucking out the sludge / slurry from depth up to 8 meters.

Tank:

The tank shall be mounted with an arrangementfor rear tipping and shall have a total internal volume of 8500 Liters. The tank shall be made of steel plates 6 mm thick confirming to IS 2062 Grade 'A' Standard. The tank shall be electrically welded with anti surge baffle plates welded internally. The inside of the tank shall be coated with epoxy paint. The compartment should be divided in two compartments of 5000 liters for fresh water and 3500 liters for Sludge / sewage. Level indicators of transparent acrylic tubing with thick wall shall be provided on each of the compartments. A 65mm filling line and 50mm drain valve shall be provided at a suitable position on the fresh water compartment. The rear door shall be top hinged openable with two double acting hydraulic cylinders. The door of the tank shall be such that it remains secure in the raised position by an incorporated pilot check valve, in the hydraulic system. For internal maintenance of the water tank compartment a man entry opening with a lid should be provided on top of each compartment. Adequate sealing and locking arrangement shall be provided to make the door leak proof. At the rear end door, the tank shall be provided with 100 mm suction cum drain valve at the bottom most position. The drain/ suction valve shall be of carbon steel, three piece construction, having a stainless steel ball. Hydraulic cylinder shall be mounted below the tank for emptying. The tank tipping angle shall be about 30 degrees. To prevent the tank from creeping down when in the raised position, a line mounted pilot operated check valve should be fitted into the hydraulic circuit. The tank shall be mounted on an auxiliary frame and shall be adequately strengthened to render it torque resistant. The auxiliary frame should be manufactured to the size of the vehicle's chassis and should be of an all electrically welded construction.

TECHNICAL DATA:

Total Capacity	:	8500 Litre
Fresh Water Capacity	:	5000 Litre
Sludge Compartment	:	3500 Litre

Construction : Cylindrical shell with torrispherical dished end

Material : 6 mm thick plates for shell, dished end and internal compartment walls as per IS 2062 Grade - 'A'.

Vacuum pump (exhauster/ compressor):

The exhauster/ compressor shall have a minimum capacity of 525 cum per hour of free air flow. It shall be capable of creating a vacuum of 90% and should empty chambers

with depths up to 8 meters. The exhauster compressor should be provided with the following:

a. Air Cooling System.

b. Lubricating Oil Pump

c. Check valve

d. 4 - way valve

The unit shall be of a dry, rotary sliding vane type and vanes made form asbestos free, spark proof material. The vacuum pump shall be mounted on frame and installed under the chassis without disturbing the original configuration of the chassis.

The system should be provided with a float valve and a moisture trap/ secondary shut-off valve to doubly protect it from accidental ingress of waste water into the system.

The exhauster / compressor working in suction and overpressure modes through the tank shall be provided with safety devices like primary shut – off ball float valve to prevent over suction, secondary shut – off cum moisture trap, cyclone, stainless steel filter mesh.

(i) Primary Shut off: fitted inside the sludge compartment to protect the exhauster / blower from any accidental ingress of sludge and other foreign particles caused due to an overflow from the storage compartment.

(ii) Secondary Shut-off / Moisture Trap: The shut-off/moisture trap protects the blower/exhauster from ingress of foreign matter and dirty water particles which may be drawn into the system due to the up streaming effect caused on the water surface, due to high vacuum conditions existing within the sludge compartment. The Cyclonic effect within this device separates out and accumulates the water particles in the airflow, which may be drained out at regular intervals through the drain valve..

TECHNICAL DATA

Delivery	:	min 430 cum/ hr free air flow;
Vacuum	:	min 90 %
Max. Pressure:		2 bar
Lubrication	:	Automatic lubrication
Cooling	:	Air - Cooled

Derrick arm (hydraulic siphon boom) & suction hose:

A 100 mm diameter spring loaded, counter - balanced suction boom arm with a capability of slewing through an angle of 300 degrees and having raising and lowering by hydraulic/ pneumatic power. It should preferably be fitted on the top rear end of the sludge compartment. A hydraulically/pneumatically operated 100 mm shutoff valve with a stainless steel plate and spindle shall be iprovided outside the tank. 100mm NB non-collapsible heavy duty flexible suction hose reinforced with hard spirals of rigid PVC shall be provided in three sections with suction strainer on last section, each fitted with Quick - fix couplings on both ends with a total length of 15m.

High pressure jetting system:

The high pressure jetting machine shall be mounted on top of the auxiliary frame with easy servicing feature. It should be suitable for cleaning Sewers from 100 mm to 900 mm dia. It should be driven by power take off unit and shall have a minimum discharge of 240 liters per minute at 140 bar of pressure. The high pressure jetting system shall have suction filter, relief valves, and unloader valves.

TECHNICAL DATA (Jetting Pump)

Quantity: 1 No.

System :

• Triplex plunger pump

• Double pressure packing

• Vertical-fitted valves

• Water spill venting

• Oil-bath mechanical parts with splash lubrication.

• Drive systems : by pulley or elastic coupling

Material Quality:

• Pump body in cast iron

• Head in chemical-nickel treated spheroidal cast iron.

• Self-adjusting shaft bearings with double roller rim.

• Forged connecting rods with antifriction bearings

• Crankshaft in nitride hardened and tempered alloy steel

• Guide pistons in surface-treated spheroidal cast iron.

• Plungers in stainless steel with ceramic coating

• Valves made in stainless steel and bronze

Delivery Capacity & Pressure: Not less than 200 LPM at 140 bar

Jetting hose and hose reel:

The Jetting Hose should be fitted on the tank's rear door. The hose reel drum should be of the pivoted type. Delivery and recovery of the jetting hose should be hydraulically operated. A single length, minimum 60 meter long with 25mm NB, high pressure thermo - plastic hose shall be provided.

Jetting Hose

TECHNICAL DATA

Length (min) : 60 m

ID (min) : 25 mm

OD (min) : 28 mm

Minimum Working pressure: 140 bar

Minimum Burst Pressure : 400 bar

Construction: Thermoplastic Technopolymer core with a two braided high tensile fiber pressure reinforcement. Outer cover, made of thermoplastic synthetic technopolymer.

HOSE REEL FOR WASHING DOWN:

A high pressure hose (mechanical) reel of minimum 10 mtrs in length and ½" of diameter with a spray gun fitted on the auxiliary frame should be provided.

Nozzles:

The equipment shall be supplied with following specialized nozzles (one each):-

(i) Bullet - nosed with rearward - facing angled jets to give self propulsion for high pressure nozzle

(ii) As above, but with a additional forward - firing jet nozzle

(iii) Bullet - nosed with rearward - facing angled jets to give self propulsion for High Discharge nozzle as above but with an additional forward firing jet nozzle

(iv) Mini nozzle with rearward - facing angled jet nozzle

(v) As above (iii) with an additional forward - firing jet nozzle - 1 No.

Pump drive:

PRIME MOVER :

The drive for all the pumps will be from the vehicle's engine through a third generation pneumatically actuated split-shaft PTO of reputed make. The PTO Unit shall be split shaft horizontal type, fitted chrome alloy steel gears on Heavy Duty ball and roller bearing in accurately machined housing. The unit shall be designed for horizontal drive, The RPM and direction of rotation of output shaft shall be the same as that of input shaft.

TECHNICAL DATA:

Throughput Torque (min) : 400 KGM

No. of outputs (auxiliary) : Two

P.T.O. Output Ratios : 1:1 on main shaft;

Hydraulic system:

The hydraulic pump shall be of ample capacity to meet the operational requirements of the system. The hydraulic system shall be provided with an oil-storage tank of suitable capacity, suction and return line filters, direction control and flow control valves. All hydraulic connections should have combination of high pressure seamless pipes and flexible hoses, to facilitate easy replacements/ repairs. Online pilot operated check valves for the tank tipping and rear door opening circuits should be provided besides the basic hydraulic component.

HYDRAULIC PUMP (TECHNICAL DATA)

Type : Gear Pump / Axial Piston Pump

Control panel:

All indicators and control elements required for remote control and monitoring shall be installed in a control panel located at the rear of the vehicle, for easy operation and monitoring.

Piping:

System piping subject to vacuum and high pressure shall be of steel and forged steel fittings. Short lengths of spiral bound heavy duty neoprene rubber suction hoses shall be fitted to provide ease and flexibility in maintenance. These rubber connection hoses should not deform or get damaged due to compressed air heat generated when the equipment is used in the pressure mode. The pipes should be clamped suitably to absorb vibrations and accessible for easy maintenance.

Prime mover:

The equipment offered shall be mounted on a suitable 16 Ton GVW truck chassis with Pneumatically operated PTO for operating pumps. The chassis shall be complete with driver's cabin.

TECHNICAL DATA:

Engine : Water cool, direct injection, 6 cylinder diesel engine

Clutch : Single plate dry type

Gear Box : Synchromesh type 5 forward 1 reverse.

Painting/ finishing:

Both, exterior and interior of the tank will be sand/ shot blasted prior to spray painting. The tank exterior shall be spray painted with two coats of superior quality anticorrosive primer and two coats of enamel metal paint.The tank interior shall be coated with 2 coats of anticorrosive grey epoxy paint to resist corrosion due to weak acids. The whole machine with cabin shall be painted with two coats of enamel paint in golden yellow colour.

Accessories:

The following accessories shallbe supplied with the equipment.

1. Two Sets of Hand Gloves and Apron.
2. Safety Boots – 1 Pair
3. Safety Helmet – 1 No.
4. Safety Goggles – 1 No.
5. Oxygen Mask With Cylinder (5 liters capacity filled with oxygen)
6. Literature and Manual as mentioned below

a) Operational manual.

b) Spare part catalogue.

c) Maintenance manual.

d) Make & detailed specification of out sourced components.

7. Tool Kit comprising of hand tools, mechanical jack, hydraulic jack of suitable capacity. A set of hand tools should have sufficient number of few ring & socket spanner, screw driver, pliers & other hand tool required for operation & maintenance of machine.

8. 3 Gas monitor for H_2S , CO and O_2 -1 set

Guarantee:

The equipment supplied shall be guaranteed against any manufacturing defect for two year from the date of commissioning.

15. Vehicle mounted sewer cleaning jetting machine of 3000 liters.

GENERAL:

The LCV mounted Jetting machine, shall be capable of jetting civil and industrial sewers. It should consist of a cylindrical cross – section tank having a volumetric capacity of 3000 litres. The complete equipment should be mounted on a vehicle chassis of GVW not less than 7 tons (and a rating of not less than 75 HP.

TANK:

The tank should be of cylindrical horizontal/ rectangular cross section with dished ends and should have a capacity of 3000 ltrs. The whole tank should be made of steel plates 5 mm thick confirming to IS 2062 Grade 'A' Standard. The tank should be of electrically welded construction. The tank should be internally stiffened and 1 no. anti-surge baffle should be provided to give dynamic stability to the vehicle. Level indicators of transparent acrylic tubing thick - walled should be provided on the tank. A 65mm filling line and 50mm drain valve should be provided at a suitable position. For internal maintenance of the tank a man entry opening with a lid should be provided on top of the tank. The tank should be mounted on an auxiliary frame of ISMC 100 section and should be adequately strengthened to render it torque resistant. The auxiliary frame should be manufactured to the size of the vehicle's chassis and should be of an all electrically welded construction.

TECHNICAL DATA:

Capacity : 3000 LTRS

Construction : Cylindrical, shell with torrispherical dished ends, tank built to ASME code section VIII, DIV - I.

Material : 5 mm thick plates for shell, dished ends & Internal compartment walls as per IS 2062 Grade - 'A'.

HIGH PRESSURE JETTING SYSTEM:

The high pressure jetting machine shall be mounted on top of the auxiliary frame with easy servicing feature. It should be suitable for cleaning Sewers from 100 mm to 400 mm dia. It should be driven by power take off unit and shall have a minimum discharge of 120 liters per minute at 140 bar of pressure. The high pressure jetting system shall have suction filter, relief valves, and unloader valves.

TECHNICAL DATA (Jetting Pump)

Quantity : 1 No.

System :
- Triplex plunger pump
- Double pressure packings
- Vertical-fitted valves
- Water spill venting
- Oil-bath mechanical parts with splash lubrication.

• Drive systems : by pulley or elastic coupling

Material Quality :

• Pump body in cast iron

• Head in chemical-nickel treated spheroidal cast Iron

• Self-adjusting shaft bearings with double roller rim.

• Forged connecting rods with antifriction bearings

• Crankshaft in nitrided hardened and tempered alloy steel.

• Guide pistons in surface-treated spheroidal cast Iron

• Plungers in stainless steel with ceramic coating

• Valves made in stainless steel and bronze

Delivery Capacity & Pressure: 120 lpm at 140 bar

JETTING HOSE REEL:

The Jetting Hose should be fitted on the tank's rear door. The hose reel drum should be of the pivoted type. Delivery and recovery of the jetting hose should be hydraulically operated. A single length, minimum 60 meter long with 25mm NB, high pressure thermo - plastic hose shall be provided.

JETTING HOSE (THERMOPLASTIC)

TECHNICAL DATA:

Length (min) : 60 m

ID (min) : 19 mm

OD (min) : 28 mm

Minimum Working pressure : 140 bar

Minimum Burst Pressure : 400 bar

Construction : Thermoplastic Technopolymer core with a two braided high tensile fibre pressure reinforcement. Outer cover, made of thermoplastic synthetic technopolymer.

HOSE REEL FOR WASHING DOWN:

A high pressure hose (mechanical) reel of min. 10 mtrs in length and ½" of diameter with a spray gun fitted on the auxiliary frame should be provided.

PUMP DRIVE:

Drive for the vacuum pump and the wash water pump shall be taken from power take off (P.T.O.) of the truck. PTO shall have one auxiliary output drive shafts . Changeover of various drives should be pneumatically operated.

TECHNICAL DATA

Throughput Torque : min 400 kgm

No. of outputs (auxiliary): One

P.T.O. Output Ratios : 1:1 on main shaft;

HYDRAULIC SYSTEM:

The hydraulic pump should be of ample capacity to meet the operational requirements of the system. The hydraulic system shall be provided with an oil-storage tank of suitable capacity, suction and return line filters, direction control and flow control valves. All hydraulic connections should be combination of high pressure seamless pipes and flexible hoses, to facilitate easy replacements/ repairs. Online pilot operated check valves for the tank tipping and rear door opening circuits should be provided besides the basic hydraulic component.

HYDRAULIC PUMP (TECHNICAL DATA)

Type : Gear Pump / Axial Piston Pump

NOZZLES:

The equipment shall be supplied with following specialized nozzles (one each):-

(i) Bullet - nosed with rearward - facing angled jets to give self propulsion for high pressure nozzle

(ii) As above but with a additional forward - firing jet nozzle

(iii) Bullet - nosed with rearward - facing angled jets to give self propulsion for High Discharge nozzle as above but with an additional forward firing jet nozzle

(iv) Mini nozzle with rearward - facing angled jet nozzle

(v) As above (iii) with an additional forward - firing jet nozzle - 1 No.

CONTROL PANEL:

All indicators and control elements required for remote control and monitoring will be installed on angle frame a located at the rear of the vehicle

PAINTING / FINISHING

Both, exterior and interior of the tank will be sand/ shot blasted prior to spray painting. The tank exterior shall be spray painted with two coats of superior quality anticorrosive primer and two coats of enamel metal paint.The tank interior shall be coated with 2 coats of anticorrosive grey epoxy paint to resist corrosion due to weak acids. The whole machine with cabin shall be painted with two coats of enamel paint in golden yellow colour.

ACCESSORIES:

The following accessories should be supplied along with the equipment.

1. Two Sets of Hand Gloves and Apron.
2. Safety Boots – 1 Pair

3. Safety Helmet – 1 No.

4. Safety Goggles – 1 No.

5. Oxygen Mask With Cylinder (5 liters capacity filled with oxygen)

6. Literature and Manual as mentioned below

a. Operational manual.

b. Spare part catalogue.

c. Maintenance manual.

d. Make & detailed specification of main components.

7. Tool Kit comprising of hand tools, mechanical jack, hydraulic jack of suitable capacity. A set of hand tools should have sufficient number of few ring & socket spanner, screw driver, pliers & other hand tool required for operation & maintenance of machine.

8. 3 Gas monitor for H_2S , CO and O_2 -1 set

GUARANTEE

The equipment shall be guaranteed against any manufacturing defect for two years from date of commissioning

16. LCV mounted Sewer Cleaning Suction Machine of 4000 litres:

The Sewer cleaning suction machine shall consist of a tank of 4000 litres capacity along with suction pump. The complete equipment shall be mounted on a truck chassis of GVW not less than 7 tons and an engine Horse Power rating of not less than 90 HP to meet BS-III emission standards. The equipment should be capable of sucking out the sludge / slurry from depth up to 8 meters.

Vehicle	TATA 709 SFC Cabin fitted with PTO or Ashok Leyland vehicle with equivalent specifications
Tank	
Capacity	4000 LTRS
Shape	Round shell and spunned dish end with knuckle radius.
Material	5mm thick M.S sheet (conforming to IS: 2062)
Suction Pump	
Make / type	MORO/JUROP Italian make rotary vane pump
Capacity	Free air capacity : 390 CU.M/HR Max. Vacuum : 92% Max pressure : 1.5 bar RPM :1300 RPM

Salient features	• Natural or forced convection air cooling • Inbuilt lubricating pump • Inbuilt check valve • Inbuilt change over valve • Asbestos free spark proof vanes • Positive displacement of rotary vanes
Tank Suction Hose	
Size	75 mm dia. x 15 metres long
Material	Heavy duty PVC hose
Tank Suction Valve	
Type/size	80mm ball valve
Discharge Valve	
Type/size	100mm ball or butterfly valve
Rear Door	Spunned dish end with knuckle radius hinged type open able rear door for cleaning purpose having airtight heavy-duty rubber gasket.
Accessories and Safety Devices	
Primary shut Off Valve	Ball type float valve is provided inside the tank body to prevent the water entering into the vacuum pump due to overflowing of the tank.
Secondary shut off & safety filter	It is provided to the inlet of the suction pump to prevent water /slurry entering into the pump
Pressure Relief and vacuum relief valve	**Imported** Italian make heavy-duty spring type adjustable pressure relief valve is fitted to safeguard the tank from excess pressure and vacuum creating inside the tank.
Quick Coupler	**Imported** quick coupler of sufficient diameter to connect the hose/metal pipes.
Compound Gauge	100mm dial, pressure range: 0-4 kg/cm2, vacuum: 0-760 mm of Hg
Level Gauge	Transparent sludge/water level gauge, fitted throughout the height of the tank.
Tool Box	Tool box are provided on both side of the tank made from M.S pipe/angle structure and 18 g M.S sheet
Mudguard	Made from 16 g M.S sheet on both tyres with mud flap
Paint	• Epoxy paint inside the tank body • Two coat of zinc based red-oxide • Two coat of synthetic enamel

17. Auto-rickshaw mounted sewer cleaning jetting machine of 500 liters capacity

JETTING PUMP

Capacity : Min 13 LPM and pressure up to 207 bar

Pump R.P.M. : 3400 Max.

Construction& Material Quality:

- Forged brass pump head and conrods with high mechanical resistance and corrosion proof.
- S.S. check valve and piston guide
- Solid ceramic plunger highly corrosion and abrasion proof.
- High quality double sealing gasket (For high and low pressure) in buna textile "V" packing.
- Anodised aluminium DIE-CAST crank case fins that ensure optimal oil temperature.
- Having hollow shaft of 25mm NB & J flange for direct coupling to engine.

TANK

Capacity : 500 Litres

Shape : Cylindrical horizontal fitted tank.

Material : High Density Polyethylene (Roto-moulded)

ENGINE

Performance : Min 10 H.P. 3000 RPM Diesel Operated.

Type : Electric Start

Starter (optional) : Battery operated 12 V. power taken from vehicles battery.

JETTING HOSE :

Type : Special High pressure jetting house.

Housing I.D. : dia ¼"

Minimum working pressure :220 bar

Minimum bursting pressure :440 bar

Hose length : 30 Mtrs.

Construction

Core : Thermoplastic

: Techno polymer

Pressure : Two Braided High Tensile

Reinforcement: Synthetic Fibre

Outer Level : Thermoplastic

Technopolymner

Temperature : (40^0 C to 120^0 C)

Fitting :S.S. Fitting on both sides of sewer jetting house and fitted with high pressure self propagating heavy duty S.S. Jetting Nozzle.

HOSE REEL

- Manual
- Fitted with heavy duty S.S. Rotary Joint.
- Capable of winding 30 mtrs. Long sewer jetting house.
- Also capable to accommodate 60 mtrs. Long jetting house.

AUXILIARY SPRAYING GUN.

Spray Gun : Adjustable type to spray water / pesticide water mixture, max. discharge 25 Lpm at 250 bar. Inlet G3/ 8F with lense adapter. Inlet Size. G1/4m.

Out let : M 22 x 1.5

Size of lense with nozzle inlet : M 22 x 1.5

Size of Nozzle (min) 1.2 mm dia

Type :Special high pressure house fitted with spraying gun.

House I.D. : dia ¼"

Application : 10 Mtrs.

VALVE

- Lever operated 3 way high pressure ball valve for main house reel.
- Lever operated 3 way high pressure ball valve for auxiliary spraying gun.
- Drain valve : 25 mm Ball valve

ACCESSORIES & SAFETY DEVICES

a) Heavy Duty glycerin filled pressure guage.

b) Flexible water level indicator

c) Unloader valve.

Max. flow : 30 Lpm

Outlet : M 22 x 1.5 m

Inlet : G3 / 8 M

Bypass : G3 / 8 M

d) Water level alarm audio / visual

e) Suction gate valve

f) Focus light at front & rear

g) Search light with extendable wire

h) Tank filling Cap atop of the tank

i) Safety valve.

Pressure Range : 220 Bar

Discharge : 24 Lpm max.

Inlet : G3/ 8 F

Bypass : G3/ 8F

j) Inlet filter of mesh 50, cartridge Dia 50 x 150 mm, polypropylene body, epdm gasket, polypropylene cartridge frame, working pressure 10 bar max

k) Pesticide injector

Inlet : 3 / 8F

Outlet : 3 / 8M

Nozzle : 2.1 MM

SIDE PANELING

Structure made from either M.S. Square pipe or M.S. Angle and covered with 18 G. Aluminum sheet.

REAR DOOR

Hinged Type rear door with locking arrangement to protect the pump, engine, hoses etc. from mishandling.

PAINTING

1) Two coats of zinc based red oxide paint

2) Two coats of shade polyethylene paint as per choice

OVERALL DIMENSION

Overall Length: 2930 mm appox.

OVERALL WIDTH : 1490 mm appox.

Diesel Three wheeler Chassis

Make:- BAJAJ-GC-1000 / PIAGGIO ape D600 / Equivalent

Engine : Pear Engine (Diesel)

Type : Single cylinder four stroke, direct injection, diesel Engine

Displacement	:	395 CC
Maximum Power:		8.0 B.H.P. @ 3600 rpm
Fuel Efficiency:		36 ± 4 KM / LTR.
Maximum Speed:		50 KM / HR
Starting	:	Electric, Self Start
Cooling	:	Forced air cooled
Gear Box	:	4 Forward + 1 Reverse
Chassis	:	Chassis shall be of reputed make having 950- 1000 kgs.GVW. The specifications shall be as per the standards of the chassis manufacturer

Suspension

Front : Dual action hydraulic telescopic shock absorber with helical springs.

Rear : Independent suspensions triangular arm, rubble compression spring & dual action hydraulic shock absorbers.

Steering : Handle bar type

Breaks :Tandem master cylinder, Hydraulically operated, internally expanding shoe type on all wheels.

Fuel Tank : 10.5 Ltrs.

Weight & Dimension

SVW	: 975 Kgs. Maximum
Maximum Length	: 2930 mm
Maximum Width	: 1490 mm
Maximum Height	: 1635 mm
Wheel Base	: 1920 mm
Turning Radius	: 2750 mm
Track Width	: 1260 mm
Cargo Bed	: 1480 mm x 1400 mm
Tyres	: 4.5 x 10, 8PR
Wheels	: 3 Stud type
Axles	: Rear wheel drive by 2 propeller shafts
Min. Ground clearance	: 165 mm
Front Axle	: Non driven stub axle
Rear Axle	:Independent drive

Driver's cabin	: Manufacturer's original complete closed type driver cabin having two doors with windows & locks, light weight made out of pressed sheet.

18. FOGGING MACHINE

The technical specifications of the equipment required by the purchaser are indicated in preceding paragraph. The Bidders shall complete the technical specifications for the Goods offered in their entirety so as to demonstrate their compliance with the requirements of the Contract Agreement.

Portable Fogging Machine (Manual)

Size	As per manufacturer's design
Weight empty	Minimum Possible
Solution Tank	1 No. of 5 Litre of HDPE with markings
Fuel Tank	Min 2 Litre with markings
Engine Capacity	Suitable for flow rate of 12-15 litre/hour
Average Fuel Consumption	Minimum possible
Flow Rate	12-15 litre/hour according to dosing nozzles used
Droplet size range	<20 µm (oil)
Ignition	Electronic ignition coil fed by 4 dry batteries each with 1.5 volt = 6 Volt
Starting device	Finger tip PVC pump
General	Fuel tank made up of transparent heavy duty polythene & should be non-pressurized
Others	Machine approved by WHO or appreciated by National Malaria Eradication Program

Vehicle Mounted Fogging Machine

Size	As per manufacturer's design
Weight empty	Minimum possible
Solution Tank	2 Nos each of 50 litre of HDPE or Stainless Steel
Fuel Tank	Min 20 litres (fuel tanks are not pressurized)
Engine Capacity	Suitable for flow rate of 60-190 liter/hour
Filters	in fuel and formulation lines
Average Fuel Consumption	Minimum possible
Flow Rate	60-190 litre/hour according to dosing nozzles used
Droplet size range	<20 μm (oil)
Ignition	Electronic ignition coil fed by 4 dry batteries each with 1.5 volt = 6 volt
Starting device	Finger tip battery start
Battery	12v
Minimum output	approximately 3000 cum/min.
Principle engine	Single minimum 40 hp pulse-jet
Control	All formulation controls at operators hand
Paint	Chemical resistant epoxy paint
General	Machine should have Bio- Technique i.e. injection water together with the fog for a kind of cold fog application
Others	Machine should be appreciated by NVBDCP

Chassis:	Make: Ape/Tata Ace/Force Motors
	Gross vehicle weight: Minimum 1500 Kg.
	Pay load: Min. 735 Kg.
	Engine: Fuel efficient, 4-stroke, indirect injection diesel engine delivering around 13 HP at rated RPM BS-III Model
	Clutch: Single plate dry friction type

Gear Box Type: Synchromesh

No. of gears: 4 forward and 1 reverse.

Steering: Mechanical

Service Brakes: Dual circuit hydraulically activated.

Parking Brakes: cable operated on rear wheels

Engine Exhaust Brake: Pneumatically operated with foot control valve.

Suspension: Parabolic leaf spring at front and rear

Shock absorber: Hydraulic double acting telescopic type both front & rear.

Wheels & tyres Wheel base: minimum 2000 mm

Tyres: 145 R12 - 8 PR Radial.

No. of wheels: Front: 2, Rear: 2, Spare: 1 (Lockable)

Fuel Tank Capacity: Maximum 30 litres approximately

Cabin: should have foam padded adjustable seat having seat belts. Cab should have all standard accessories like open able side windows, rear view door mirrors, laminated windscreen, two speed windshield wipers, fuel gauge, multiple warning lamps and buzzer for low oil pressure, coolant level etc.

19. MOBILE TOILET

The technical specifications of the equipment required by the purchaser are indicated in preceding paragraph. The Bidders shall complete the technical specifications for the Goods offered in their entirety so as to demonstrate their compliance with the requirements of the Contract Agreement.

Mobile Toilets (10 Seater)

No of toilet	10 numbers [5+5]
Toilet size	33” (min.) x 31” (min.) x 78”
Toilet tub	Non-corrosive and easy to clean fibre glass tub
Panelling	18 G aluminium sheet
Doors	Shall be of size 6’ x 2’3” made from using M.S. angle 25 x 25 x 3 mm and M.S. flat of size 25 x 3 mm covered with 18 G aluminium sheet with tower bolt, door handle, locking bolt and but hingers
Roof Top	Made of M.S. angle 40 x 40 x 6 mm and M.S. Tee 40 x 40 x 5 mm having round shape projection and covered with FRP sheet.
Flooring	FRP molded floor panel integrated with squatting pan, footrest and skirting
SIDE PLATFORM	
Type	Fixed/foldable platform on both the side of toilet with side railing.
Material	Made of M.S. angle 75x40 mm and 25 x 5 mm MS flat with aluminium checker plate side railing made from MS Pipe.
Ladder	Foldable type ladder on both the side of toilet made using special type hingers pin & bush, M.S. Box Pipe 2” x 1” and M.S. angle 40 x 40 x 5 mm.
BIO-DIGESTER TANK	
Capacity	2200 litres
Material	FRP Molded
Fittings	Connection of each toilet with 110 mm dia. PVC pipe of ISI mark with P-Trap and other fitting and one connection of waste gas pipe.

Disposal Technology	Disposal of human waste in a 100% ECO friendly manner, continuous anaerobic treatment process using bacterial inoculums, maintenance free. Disposal of sludge should not be required.
Quality of Effluent	Treated effluent should be odor less and be good for irrigation purpose of near by gardens, lawns etc.
Bio-Gas	Color less, odor less inflammable bio gas should be generated.
WATER TANK	
Capacity	1000 litres (min.)
Material	HDPE (Sintex make)
Fittings	• Water filling line at front of the toilet van • Plumbing line with push-pull type tap from water tank to all toilet compartments as well as at both washbasins.
TRAILOR SPECIFICATION	
Size of Trailer	5.68 m length x 2.74 m width x 3.15 m height from ground level
Turn table	Heavy duty full turn with spring cushion type tow bar made from ISMC 100 x 50
Base frame	Made from M.S. angle of size 150 x 75 mm, 75 x 40 mm and 100 x 50 mm
Cabin Structure	Made from M.S. angle of size 40 x 40 x 6 mm, M.S. Tee of size 50 x 50 x 6 mm and 40 x 40 x 5 mm
Tyre	
Number	2 front, 2 rear
Size	7.50 X 16-16 PR
Axle	
Number	02
Material	65 x 65 mm M.S sq.
Hub	
Number	04
Material	Cast steel

Bearings	
Number	08
Type	Taper roller
Brake	Parking and service type internal expanding shoe brake
Suspension	Semi elliptical leaf spring on four wheels
ACCESSORIES	• Discharge valve-110mm heavy-duty gate valve at rear bottom of Bio-Digester tank with hose nipple and 100 mm dia. Flexible pipe of 20' length. • Mirror –02 no's • S.S wash basin – 02 no's • Napkin hanger-02 no's • Soap keeper – 2 nos. • Toilet lamps (a/c supply) in each toilet with controlling of MCB • Foldable ladder – 2 nos. • Push-pull type taps to all toilet compartments and at washbasin. • Mud guard on rear wheels. • Tool Box cabin of size 72" x 46"